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**(Acarina: Liroaspina)**

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# Bulletin of the Chicago Academy of Sciences

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## Uropodellidae, a New Family of Mesostigmatid Mites Based on *Uropodella laciniata* Berlese, 1888 (Acarina: Liroaspina)

Joseph H. Camin

*The Chicago Academy of Sciences*

A widespread and primitive species of mite, *Uropodella laciniata*, was described by Berlese (1888) from a series of specimens collected in Argentina, Brazil and Paraguay. It is the type and, to this date, the only described species of the genus *Uropodella* Berlese, 1888. At the time he described it, Berlese placed the species in the subfamily Uropodinae of the family Gamasidae. In a later paper (Berlese, 1918) he listed it under the tribe Polyaspidini of the family Uropodidae.

Trägårdh (1941) placed most of the members of Berlese's tribe Polyaspidini in the cohort Trachytina Trägårdh, 1938. After studying the holotype of *U. laciniata*, Trägårdh (1941) concluded that this species had been wrongly classified and suggested that it was probably most closely related to the members of the genus *Sejus*. This conclusion, although more nearly correct than Berlese's classification of the species, was based on misinterpretations of the morphology of the holotype specimen. In describing the species, Berlese stated that the sexes were very difficult to differentiate. Trägårdh cited this statement as evidence that Berlese was unable to distinguish the sexes of *U. laciniata* and, upon examination of the holotype specimen, he concluded that it is a male.

The female of *U. laciniata* has a crescentic notch at the anterior margin of the epigynial shield. Not being permitted to dissect the holotype specimen, Trägårdh interpreted this notch as a male genital

aperture at the anterior margin of an immovable sternal shield. He naturally concluded that *U. laciniata* is a parasitoid species and, probably because of the rough integument, suggested its relationship to *Sejus*. The holotype of *U. laciniata* is actually a female, just as Berlese described it.

Recently a large number of specimens of *U. laciniata* or a very closely related species of the same genus have been taken from basal tree holes in the states of Illinois, Missouri, Virginia, North Carolina and Mississippi. Comparisons of these specimens with drawings of the holotype specimen of *U. laciniata*, which were very kindly supplied by Dr. Max Sellnick of Hamburg, Germany, have revealed no significant differences between the North and South American specimens. For this reason, until a more thorough comparison of the mites can be undertaken, it must be assumed that the specimens from the United States are *U. laciniata* and that this species probably ranges throughout the western hemisphere.

Because of the prevailing confusion concerning the morphology and classification of *Uropodella laciniata*, the female is redescribed in this paper and the male and immature stages are described for the first time. The proper taxonomic position of the genus and species is also discussed. The descriptions are based on the series of specimens from the United States. It is entirely possible that these may eventually prove to be representatives of a second species, but they are unquestionably members of the genus *Uropodella*.

### Description of *Uropodella laciniata* Berlese, 1888

**ADULT FEMALE.** Body averaging 720 X 490  $\mu$  (Table I) , broadly oval in shape, with vertex projecting anteriorly and bearing many strong spines ; dark brown in color ; rough in texture, with many alveolate or reticulate shields and leaf-like setae. Legs medium to long, tending to curve forward in mounted specimens, producing a crab-like appearance.

*Venter*, Figure 1. All shields heavily sclerotized, complex, alveolate or reticulate. Epigynial shield (Fig. 5) very large, extending from posterior margins of coxae IV to middle or anterior margins of coxae II ; with many leaf-like setae. Epigynial shield covering much of sternal shield, reaching almost to the base of the tritosternum in unmounted, unflattened specimens ; with a pair of forward projections at the anterolateral corners, forming a crescentic notch along the anterior margin of the shield. This notch on the female epigynial shield has been misinterpreted by Trägårdh and others as the male genital aperture. A pair

of narrow, elongate plates, lying in an elastic membrane, connect the anterolateral margins of the epigynial shield with the endopodal regions near coxae IV. Tritosternum (Fig. 6) with moderately large base

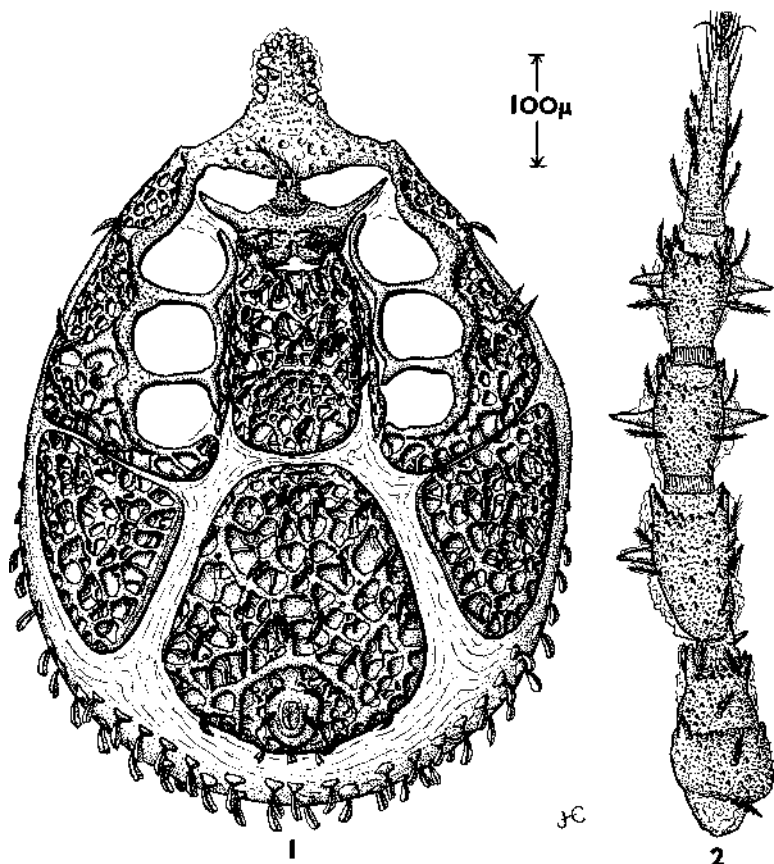


Figure 1. Venter of *Uropodella laciniata* female, legs and gnathosoma removed. Figure 2. Leg I of female.

covered with spiny denticles ; two lacinae with many long setules. Sternal shield (Fig. 6) divided between sternal setae II and III. Sternal shield I-II the larger, extending from base of tritosternum to middle of coxae II ; with a pair of elongate anterolateral arms extending be-

tween coxae I and II ; with two large lobes posteriorly, each bearing a raised mound laterally with many long, flat, pointed denticles on the posterior margin, giving the mounds a "shaggy" appearance. Sternal setae I and II large and feathery. Setae I placed in the center of each mound, setae II arising from the base of each mound, posteriorly, from under the "shaggy" denticles. In life, the anterolateral projections of

**Table I\*. Measurements of *Uropodella laciniata* Berlese**

Part measured	$\bar{x}$	$s$	Range observed
<b>Female:</b>			
body length	719.8 $\mu$	29.7 $\mu$	682.6 - 762.7 $\mu$
body width	481.9	28.8	439.8 - 517.0
leg I	741.7	26.8	715.8 - 794.9
leg II	583.0	21.2	550.2 - 618.2
leg III	484.0	22.8	450.8 - 529.0
leg IV	530.6	26.5	489.5 - 586.0
<b>Male:</b>			
body length	634.8	20.1	588.8 - 653.2
body width	401.5	11.6	380.9 - 416.8
<b>Deutonymph:</b>			
body length	610.9	32.2	563.0 - 644.0
body width	380.7	14.4	355.1 - 399.3
<b>Protonymph:</b>			
body length	472.8	28.5	426.9 - 518.0
body width	349.9	16.6	319.2 - 375.4
<b>Larva:</b>			
body length	365.7	....	349.6 & 381.8
body width	301.7	....	290.7 & 312.8

\*Measurements were made on ten randomly selected specimens of each stage, except the larva (2 specimens).  $\bar{x}$  = mean;  $s$  = standard deviation.

the epigynial shield rest upon these sternal mounds, thus hiding most of the sternal shield and the sternal setae. Sternal pores not observed. Sternal shield I-II with many sharp denticles arranged roughly in horizontal rows. Sternal shield III-IV a slightly curved, horizontal bar, always hidden by anterior margins of epigynial shield. Sternal setae III and IV moderately long and simple, arranged in a horizontal row on slightly raised mounds. Sternal shield III-IV smooth, weakly sclerotized, often with an irregular, somewhat membranous and usually subintegumental anterior shelf, usually bearing a pair of slit-like depressions, which may represent a pair of sternal pores. Vertex with large, club-like anterior projection bearing many strong spines ; with a pair of small, flat, denticulate projections flanking the base of the "club" ; nonalveolate, but with many pointed or rounded denticles both dorsally and

ventrally and with some pits or depressions ; coalesced laterally with the fused peritremal-parapodal-endopodal plates. These plates are alveolate in texture except for the raised rim around the coxae, which is similar in texture to the vertex. Peritremal plates with three pairs of leaf-like

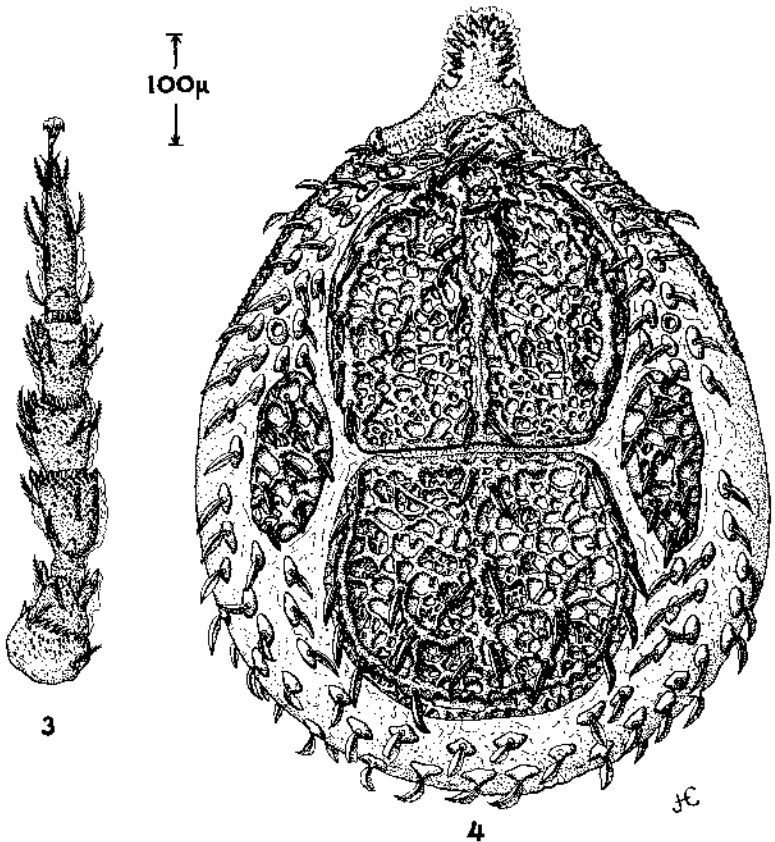


Figure 3. Leg III of female. Figure 4. Dorsum of female.

setae, one pair on slightly raised projections opposite anterior margins of coxae II, the remaining two pairs close together on a slightly elevated area opposite the middle of coxae III or between coxae III and IV. Stigmata between coxae III and IV ; peritremes difficult to discern, somewhat sinuous, following raised rim along coxae to posterior margins of

coxae I. Metapodal shields large, triangular, alveolate, without setae. Ventroanal shield large, alveolate, with many leaf-like setae. Anus on a projection, with two pairs of small, leaf-like, adanal setae and a post-anal seta. Posterior margins of opisthosoma with many large, leaf-like setae on individual, conical platelets.

*Dorsum*, Figure 4. With two large, alveolate, subequal, rounded median dorsal shields with truncate margins where the two shields meet. Narrow band of integument between anterior and posterior median

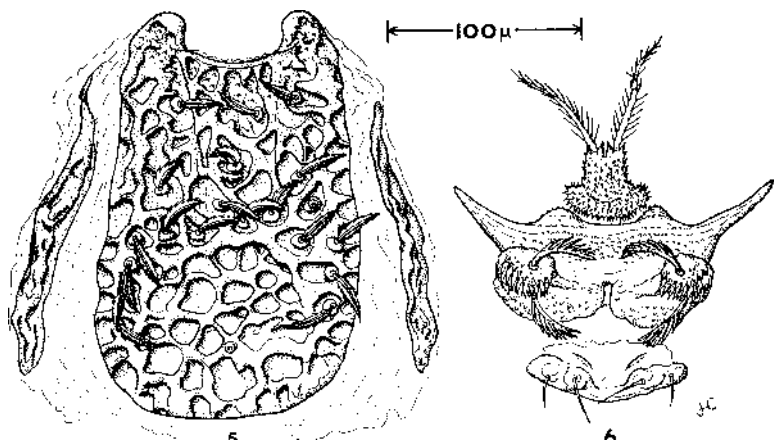


Figure 5. Epigynial shield of female. Figure 6. Tritosternum and sternal shields of female.

dorsal shields covered with minute denticles. Anterior dorsal shield usually with six pairs of large, leaf-like setae along a longitudinal median ridge and seven pairs along the marginal ridges. Posterior dorsal shield usually with three median pairs, two submedian pairs and six marginal pairs of setae. Flanking the median dorsal shields, at the middle of the body, are two irregular, triangular to oval, lateral dorsal shields. These each bear from eight to twelve asymmetrically placed leaflike setae. The remainder of the dorsum, surrounding the median and lateral dorsal shields, possesses numerous leaf-like marginal setae, each on a separate platelet. Among the marginal platelets, lateral to the anterior median dorsal shield and just anterior to the lateral dorsal shields are a pair of minute, ring-shaped platelets without setae.



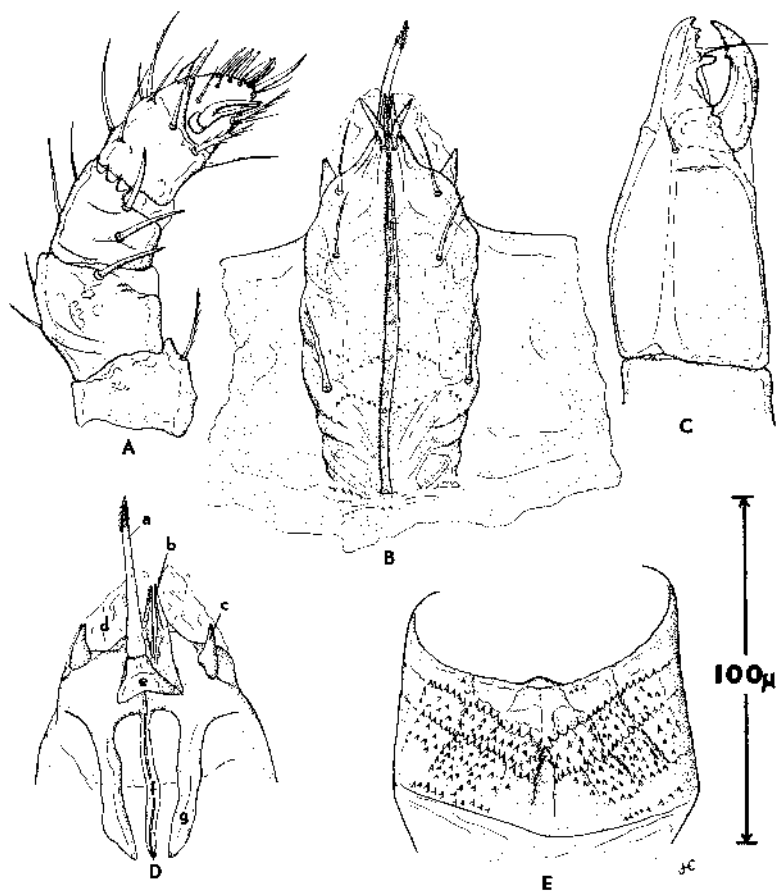


Figure 7. Gnathosomal structures of female *Uropodella laciniata*.

- A. Left pedipalp, mesial view.
- B. Gnathosomal base and hypostome, ventral view.
- C. Chelicera.
- D. Dorsal view of gnathosoma with chelicerae, pedipalps and dorsal portion of gnathosomal base removed: a — epipharynx; b — hypopharyngeal process; c — corniculus; d — hypostomal process; e — labrum; f — median epistomal apodeme; g — bar of sub-cheliceral plate.
- E. Dorsal surface of gnathosomal base with tectum.

*Legs.* Leg I (Fig. 2) longest, being equal to or slightly longer than the body. Leg III (Fig. 3) shortest and approximately two-thirds the length of leg I. Leg IV longer than III and leg II longer than IV (Table 1 ). All legs six-segmented and possessing a pretarsus with caruncle and claws. The pretarsi of legs II, III and IV differ from those of leg I in that they are attached to the tarsus by a long stalk. All legs rough in texture, with many minute denticles and some larger spines, with many large feathery setae. Tarsus I with many simple setae

Genu I and tibia I each bearing a pair of very strong spines opposite each other laterally ; femur I with a similar strong spine medially. Legs II, III and IV similar to leg I, but lacking these strong lateral spines.

*Gnathosoma*, Figure 7. Pedipalps five-segmented, excluding the coxae ; with one spiny seta on ventral surface of trochanter and several on the tibia and tarsus, a clump of rod-like sensory setae at tip of tarsus, all other setae simple, hair-like to strong and spine-like ; genu with a fringe of four teeth medially on the distal margin ; specialized seta of the tarsus with two tines. Chelicerae strong, with a seta at the base of the fixed digit and a slit-like depression proximal to the seta ; movable digit with three small teeth and one larger tooth ; fixed digit with a pair of small teeth near the tip, a large blunt tooth opposing the largest tooth of the movable digit, and a very long, seta-like tooth arising from the base of the blunt tooth. Dorsal surface of gnathosomal base covered with a patch-work of fine teeth ; tectum represented only by a very short, blunt anterior projection from the margin of the gnathosomal base. Ventral surface of gnathosomal base with a pair of spiny gnathosomal setae and two or three irregular rows of teeth in the region of the gnathosomal setae and extending into the gnathosomal groove. Proximal hypostomal setae spiny, only slightly shorter than gnathosomal setae ; median hypostomal setae simple, on a line directly anterior to proximal setae, near the bases of the corniculi ; distal hypostomal setae at tips of hypostome, inflated, membranous and often difficult to discern. Hypostomal processes broad and membranous. Corniculi short, strong and simple ; hypopharyngeal processes strong, simple, sharply pointed anterior projections ; labrum simple, triangular, fleshy ; epipharynx long, tongue-like, with a brush of minute setules at the tip ; median epistomal apodeme present, with a strong, longitudinal ridge extending from the epistome. Hypopharyngeal and salivary styli lacking.

**ADULT MALE.** Body averaging  $635 \times 435\mu$  (Table 1), similar in shape and general appearance to female.

*Venter*, Figure 8. All shields of ventral surface coalesced, so that entire surface is sclerotized. Marginal band unsclerotized, but with many marginal setae on individual platelets, as in female. Genital aperture in sternal shield, between hind margins of coxae II, covered by a thin operculum. Sternal setae I and II as in female, associated with "shaggy"

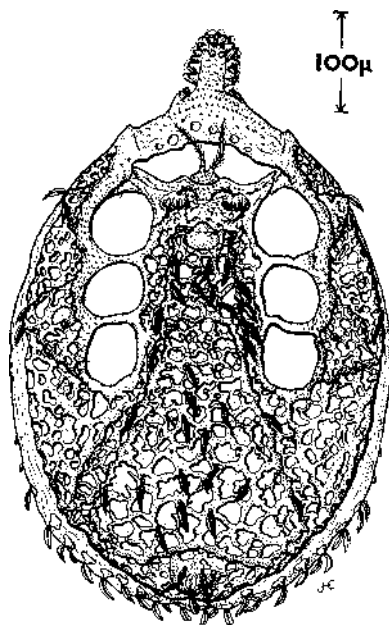


Figure 8. Venter of male.

mounds ; sternal setae III somewhat shorter and feathery rather than simple, flanking genital aperture ; sternal setae IV indistinguishable from other leaf-like setae behind genital aperture ; sternal pores not seen. Remaining chaetotaxy, tritosternum, peritremes and vertex as in female.

*Dorsum*, *legs* and *gnathosoma* as in female, but proportionately smaller.

DEUTONYMPH. Body averaging 645 X 400 $\mu$  (Table 1), similar in general appearance to adult, but slightly more elongate, less heavily sclerotized and lighter in color. Vertex shorter, pointed rather than club-like.

*Venter*, Figure 9. Tritosternum as in adult. Sternal shield extending from base of tritosternum to middle of coxae **III** ; weakly sclerotized, covered with pustules or blunt denticles, with suggestions of the beginnings of alveolation near margins. Sternal shield with first three pairs of feathery sternal setae. Sternal setae **I** opposite anterior margins of coxae **II**, with sternal pores **I** slightly posterior and mediad to setae ; setae **II** opposite posterior margins of coxae **II**, with pores **II** posterior and mediad to setae ; setae **III** at posterolateral margins of shield, opposite anterior third of coxae **III** ; sternal pores **III** in soft integument, just behind posterior margin of sternal shield, posterior and mediad to sternal setae **III** and mediad to setae **IV**. Sternal setae **IV** leaf-like, on separate metasternal plates, directly behind setae **III**. Anterior margin of sternal shield with four flower-like projections, which resemble minute sea anemones. Area directly behind sternal shield, between coxae **III** and **IV** with four to six leaf-like setae, besides metasternal setae, on individual platelets. Fourth endopodals fused around posterior margins of coxae **IV** with associated parapodals, forming heavy alveolate shields. Peritremals and remaining parapodal and endopodal shields not formed. Stigmata between coxae **III** and **IV**, peritremes clearly visible, extending as in adults to base of coxae **I**. Metapodal shields similar to those of female, but relatively small. Area between coxae **IV** and ventroanal shield with five pairs of setae on individual platelets. Homologues of these setae are on the ventroanal shield in the adult. Chaetotaxy of this region combined with that of the ventroanal shield of the nymph is very similar to that of the adult ventroanal shield. Ventroanal shield with heavily sclerotized, alveolate anterior and lateral margins ; central portion weaker, pustulate ; anus on a round disc, similar to that found on liroaspid nymphs and superficially similar to the anal disc of the phoretic nymphs of the uropodines. It is probably this character that caused Berlese to place the genus in the Uropodidae. Anal disc with two pairs of simple adanal setae and a simple postanal seta.

*Dorsum*, Figure 10. Vertex with a pointed anterior projection, covered with strong spines ; with one pair of leaf-like vertical setae. Anterior median dorsal shield very similar to that of the adult, but smaller ; with five pairs of leaf-like median setae and four pairs of marginal setae. Posterior median dorsal shield narrower and more elongate than that of adult, separated from anterior shield by a wider space, reaching to the tip of the opisthosoma and fusing with the ventroanal shield ;

with six median pairs of setae, the first pair sometimes being on separate platelets, with one pair of submedian and seven pairs of marginal setae, the posterior pair being almost twice the length of any other dorsal setae. Both median dorsal shields heavily sclerotized and alveolate. Lateral dorsal shields not yet formed, but numerous marginal setae on individual platelets already present. A pair of ring-shaped platelets among the marginal platelets and flanking anterior median dorsal shield present, as in adult.

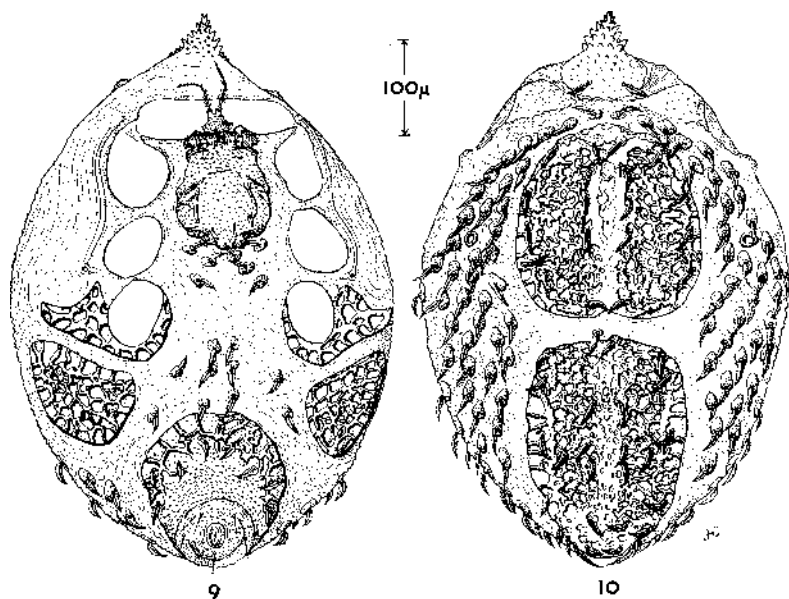


Figure 9. Venter of deutonymph. Figure 10. Dorsum of deutonymph.

*Legs* and *gnathosoma* similar to those of adult, but proportionately smaller.

**PROTONYMPH.** Body averaging  $520 \times 375\mu$ , (Table 1) ; broadly oval ; light tan to white in color ; covered with numerous weakly sclerotized pustules, giving a "pebbled" appearance. Anterior projection of vertex not yet developed. Body shields not fully formed, distinguishable as groups of sclerotized, minute pustules.

*Venter*, Figure 11. Tritosternum as in adult. Sternal shield narrow, elongate, extending from anterior margins of coxae II to a point opposite the middle of coxae IV ; with first three pairs of feathery sternal setae on individual platelets; sternal pores I and II similar in position to those of deutonymph ; pores III not seen ; metasternal setae not present. Anterior margin of sternal shield with two *Metridium-like* projections, similar to the four projections on the sternal shield of the deutonymph. Fourth parapodal and endopodal plates formed around posterior margins of coxae IV. Stigmata between coxae III and IV, peritremes extending only to posterior margins of coxae II. Anus on a slightly raised mound, covered anteriorly by minute pustules, as are the other body shields, and posteriorly by sharp denticles ; with one pair of

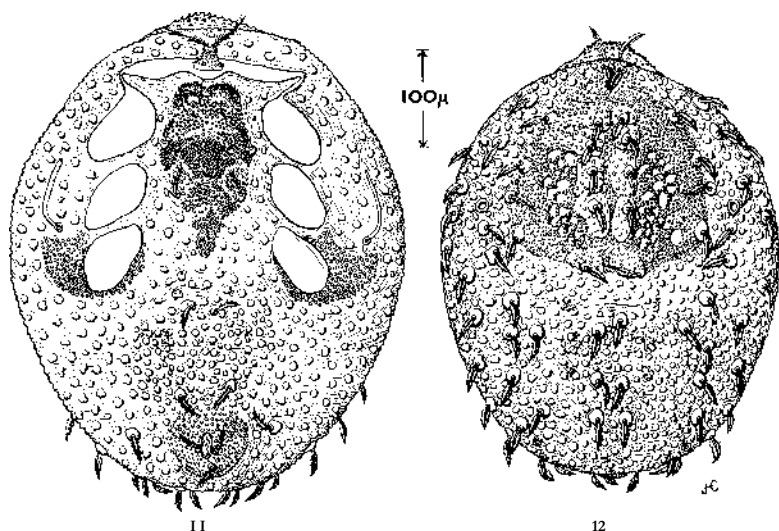


Figure 11. Venter of protonymph. Figure 12. Dorsum of protonymph.

leaf-like or feathery adanal setae and a postanal seta. Ventral region with six minute, subintegumental sclerotized patches ; with a pair of setae on line with posterior margins of coxae IV, another pair just anterior to the anal shield and a pair flanking the anal shield. Several setae on individual platelets along posterior margin of opisthosoma.

*Dorsum*, Figure 12. Vertex with many spines and a pair of leaflike setae, but no anterior projection. Anterior median dorsal shield present as a large group of minute pustules ; with some suggestion of

the beginnings of alveolation ; with five or six pairs of median leaf-like setae and three or four pairs of marginal leaf-like setae, all on individual platelets. Opisthosoma with three pairs of subintegumental sclerotized patches, but no posterior dorsal shield ; with three median pairs of setae on individual platelets. Marginal setae and platelets present, but not nearly as numerous as in deutonymph. Ring-shaped platelets flanking anterior median dorsal shield present, as in adult, and a similar, but smaller, pair of ring-shaped platelets near posterior margin of opisthosoma.

*Legs* and *gnathosoma* as in deutonymph and adults.

**LARVA.** Body averaging  $365 \times 300\mu$ , (Table 1 ), broadly oval to round, whitish in color ; covered with pustules, as in protonymph ;

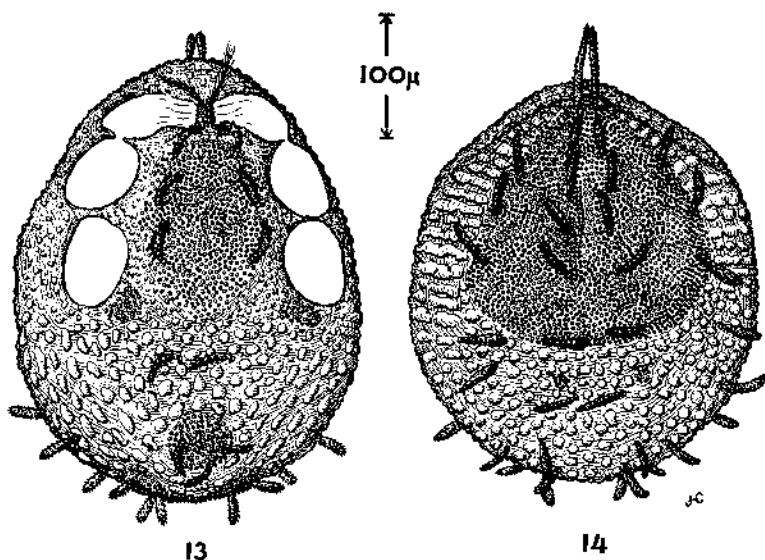


Figure 13. Venter of larva. Figure 14-. Dorsum of larva.

shields formed as groups of minute sclerotized pustules. All body setae club-like, with minute setules, rather than feathery or leaf-like.

*Venter*, Figure 13. Tritosternum as in other stadia. Sternal shield almost indistinguishable ; lacking *Metridium-like* projections ; with first three pairs of sternal setae in same positions as in nymphal stadia ; pores and metasternal setae absent. Third endopodals present. Anal shield round, with a pair of adanal setae and a postanal seta. Ventral region

with one pair of setae half-way between sternal and anal shields. A narrow, horizontal, postanal band of sclerotized pustules present at posterior margin of opisthosoma ; bearing two or three pairs of marginal setae. Opisthosomal margin with one other pair of setae on a horizontal line with the adanal setae. No stigmata or peritremes.

*Dorsum*, Figure 14. Anterior median dorsal shield formed as a large group of minute sclerotized pustules ; no suggestion of alveolation ; with five or six median pairs of setae, anterior pair probably homologous with vertical setae of nymphs and more than twice the length of other setae ; with three pairs of marginal setae. Opisthosoma with two minute patches of sclerotized pustules ; with three pairs of setae on line with the median setae of the anterior dorsal shield, three pairs on line with the marginal setae of the anterior shield, and one pair of submedian setae near the posterior margin of the opisthosoma.

*Legs*. Only three pairs of legs similar to those of other stadia, hut legs I lacking the strong lateral spines.

*Gnathosoma*. Mouthparts the same as those of other stadia, but lacking gnathosomal and proximal hypostomal setae.

In a recent revision of the suborder Mesostigmata (Camin and Gorirossi, 1955 ), several characters were cited as diagnostic for the cohort Liroaspina and the superfamily Liroaspoidea. Among these were the large, well-developed epigynial shield with many setae ; the uncoalesced sternal shields, with sternal setae II and III on different shields ; the number of dorsal shields, two or more ; and several structures of the gnathosoma. The significance of the characters of the sterni-genital region of the female and of the mouthparts in the phylogeny of the Mesostigmata was emphasized. In the gnathosoma of the primitive mesostigmatid mites, such as the liroaspines, the median epistomal apodeme is present, but these forms lack the salivary and hypopharyngeal styli.

*Uropodella laciniata* possesses this combination of characters and must be placed in the superfamily Liroaspoidea. If the species of *Sejus* that Trärdärdh had in mind were those that are now placed in the genus *Liroaspis*, his conclusion was remarkably accurate, even though his reasoning was based on a misinterpretation.

The genus *Uropodella* is closely related to the genera of the family Liroaspidae, but possesses several characters that necessitate its classification in a separate family.

In 1953, Sellnick described as new a mite from Sweden, which he called *Ichthyostomatogaster nybléni*. For this species, Sellnick erected



the family Ichthyostomatogasteridae and the cohort Ichthyostomatogasterina. Evans (1954) later demonstrated conclusively that this species was the same as that described from Italy by Berlese in 1923. Thus, Sellnick's species is a synonym of *Asternolaelaps fecundus* Berlese, 1923.

*Asternolaelaps* bears many similarities to the Liroaspididae. The epigynial shield possesses many setae, a character that is diagnostic for the Liroaspoidea. The tritosternum, the chelicerae, the arrangement of the hypostomal setae and the male genital aperture are also similar to those characters in the family Liroaspididae. For these reasons, the cohort Ichthyostomatogasterina should probably be declared invalid and the family Ichthyostomatogasteridae with its single described species, *Asternolaelaps fecundus*, should be placed in the superfamily Liroaspoidea of the cohort Liroaspinga. Dissection and comparison of the internal structures of the gnathosoma should provide a conclusive answer to this problem.

As previously stated, the genus *Uropodella* possesses several significant similarities to the genera of the family Liroaspididae and also has some characters that are similar to those of *Asternolaelaps*. As in the Liroaspididae, *Uropodella* possesses an epigynial shield with an indented or notched anterior margin and many setae. In addition, the sternal shield is divided and sternal setae III and IV are arranged in a horizontal row, the tritosternum, the chelicerae, the pedipalps, the legs, and the male genital aperture are very much alike in the two groups. Most significantly the internal structures of the gnathosoma are similar, both possessing the median epistomal apodeme and lacking salivary and hypopharyngeal styli.

The most striking resemblance between *Uropodella* and *Asternolaelaps* lies in the character of the epigynial shield, the character emphasized by Sellnick in his diagnosis of the new cohort. In addition to possessing an indented anterior margin and many setae, as in the Liroaspididae, the epigynial shield of *Uropodella* is very large, covering most of the sternal shield and reaching almost to the base of the gnathosoma. It also possesses two elongate sclerotized plates, which connect its anterolateral margins with the endopodal region of the fourth coxae. The characters of the tritosternum, the chelicerae, the hypostomal setae and the male genital aperture, in which the Liroaspididae and *Asternolaelaps* resemble each other, are also similar in *Uropodella*. In *Asternolaelaps* only three pairs of sternal setae are present, but the posterior two pairs are arranged in a horizontal line, as in the Liroaspididae and *Uropodella*. It is entirely probable that these are sternal setae III and IV and that it is the first pair that is lacking or indiscernible.

The Liroaspididae, the Ichthyostomatogasteridae and *Uropodella*, while possessing many similar characters, differ significantly in the formation of their dorsal shields and in some of the shields of the venter. In the females of the Liroaspididae there is a large anterior dorsal shield on the podosoma and usually five smaller shields on the opisthosoma plus a pygidial plate or plates. The male is variable, some species possessing the same pattern as the female and some having the five posterior dorsal shields fused as a single shield approximately equal in size to the anterior shield. Both sexes of *Uropodella* possess two large, subequal median dorsal shields and a pair of small lateral shields. A pygidial shield occurs only in the larval stage. The female of *Asternolaelaps* has a very large anterior dorsal shield, covering most of the dorsum, and a much smaller posterior dorsal or pygidial shield. In the male these are coalesced to form a single shield covering the entire dorsum.

Ventrally, in the opisthosomal region, the liroaspid females and the female *Uropodella* have similar patterns. There is a large ventroanal shield and a pair of large metapodal shields. In the male liroaspids the pattern is like that of the female or the ventroanal and metapodal shields are fused. All of the shields of the ventral surface have coalesced in the male *Uropodella*. The two sexes of *Asternolaelaps* are similar to each other, but both possess a very large ventroanal shield and a pair of linear remnants of metapodal shields.

The jugular shields of the liroaspid females are usually independent of the remainder of the sternal shield and of each other. In *Uropodella* the sternal shield is divided into only two parts, with the jugular setae placed in the centers of a pair of raised mounds on sternal shield I-II. Only three pairs of sternal setae are present in *Asternolaelaps*. The posterior two pairs are arranged in a horizontal line as are sternal setae III and IV in the Liroaspididae and in *Uropodella*. Therefore, it is suggested that the jugular setae, sternal setae I, are lacking.

The mouthparts of *Uropodella* and the liroaspids are very similar. They differ primarily in that the liroaspids possess a well-defined tectum and in that their cheliceral digits are much more elongate and have many more teeth than do those of *Uropodella*. *Asternolaelaps* also is equipped with a well-defined tectum, its chelicerae are very similar to those of *Uropodella*, but the corniculi are bifurcate rather than simple and triangular as those of *Uropodella* and the liroaspids. The internal gnathosomal structures of *Asternolaelaps* have not been described.

The genus *Uropodella* cannot be properly placed in either the family Liroaspididae or the family Ichthyostomatogasteridae, although it is unquestionably a member of the superfamily Liroaspoidea. For this reason,

a new family is herein proposed to include *Uropodella laciniata* Berlese, 1888, as the type species.

### Uropodellidae, new family

*Diagnosis.* Two large subequal median dorsal shields flanked by a pair of smaller lateral dorsal shields in both sexes. Epigynial shield of female large, extending almost to base of tritosternum and usually concealing sternal setae ; anterior margin notched ; with many setae. Female with large metapodal and ventroanal shields. Sternal shield divided as I-II and III-IV. All shields on ventral surface of male are coalesced.

*Type Genus:* *Uropodella* Berlese, 1888.

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